

A KEY FOR DETERMINING THE AFRICAN SPECIES OF ANOPHELES (SENSU LATO).

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The compilation of the following key has been a matter of no little difficulty, mainly owing to the close connection of the species in some of the groups, which sometimes makes it almost impossible to assign specific limits. The difficulty has in some cases been increased through the paucity of material, which prevents any adequate conception of the range of variability being obtained. This is particularly the case with some of the species coming from the Mediterranean region, which are very closely allied, and of which, as a rule, the British Museum possesses very few specimens. Names have only been sunk here as synonyms in those cases where there appeared to be no reasonable doubt, either after a comparison of the types, or of the descriptions, when these were sufficiently detailed. Eventually, therefore, it may be found that some forms which are here given specific rank will have to be regarded at most as varieties. Since so many figures of Anopheline wings, etc., have already appeared, it is not deemed necessary to add to their number. Some new records have been included, but on the other hand some old ones, which appeared to be questionable, have been omitted. As with the writer's previous papers, this key is merely intended to supplement the detailed descriptions which will be found in other works.

The recent subdivisions of the old genus, proposed by Mr. Theobald, have been discarded, since they grade imperceptibly into one another, and are not founded on any structural differences, while *Anopheles* in the broad sense is a very well-defined genus easily recognisable even by an amateur. It is sometimes argued that certain species are more and others less closely related, and that it is necessary to give expression to this obvious fact in our nomenclature, by the employment of a generic or subgeneric name for each group. But such a course appears to me to be quite unnecessary, and to tend merely to obscure larger relationships, while it greatly increases the difficulty of determination. In the proposed "genera" of Anophelines the characters relied upon are not only most trivial, but are sometimes variable within specific limits (e.g., "*Pyretophorus costalis*"), and may be confined to one sex. It is quite possible, too, that genera founded on such superficial characters as the width of the scales might prove to be polyphyletic. The differences found in the larvae, like those between the adults, are very slight, and moreover they do not seem to support the classification by scale characters.

The leading characters of the key will serve to indicate the approximate limits of such of these so-called genera as are African, but as Lt.-Col. Alcock has shown us,* they cannot be clearly distinguished—except perhaps *Nyssorhynchus* [= *Cellia*] and *Christya*, both of which have well-marked lateral scale-tufts, but entirely different in character, while the latter has no scales on the

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dorsal surface of the abdomen; I have seen no transition between species with abdominal scale-tufts and those without them. The divisions of *Anopheles* found in Africa to which generic names have been given are as follows:

<i>Anopheles</i> , Mg.	Type	...	...	<i>maculipennis</i> , Mg.
<i>Myzomyia</i> , Blanch.	"	...	...	<i>rossi</i> , Giles.
<i>Pyretophorus</i> , Blanch.	"	...	...	<i>costalis</i> , Lw.
<i>Feltinella</i> , Theo.	"	...	...	<i>pallidopalpi</i> , Theo.
<i>Myzorhynchus</i> , Blanch.	"	...	...	<i>sinensis</i> , Wied.
<i>Christya</i> , Theo.	"	...	...	<i>implexa</i> , Theo.
<i>Neocellia</i> , Theo.	"	...	...	<i>indica</i> , Theo.
<i>Nyssorhynchus</i> , Blanch.	"	...	...	<i>albimanus</i> , Wied.
<i>Cellia</i> , Theo.	"	...	..	<i>pharoensis</i> , Theo.

Feltinella is indistinguishable from *Pyretophorus* and *Cellia* from *Nyssorhynchus*. The group called "*Nyssorhynchus*" in the fourth and fifth volume of Theobald's Monograph is really unnamed, since the type species of *Nyssorhynchus* has pronounced lateral scale-tufts.

Key to the African Species of Anopheles.

1. Thorax with distinct broadish-elliptical scales (except in *A. christyi*); female palpi shaggily scaled; abdomen usually more or less scaly 2.
- Thorax clothed with hairs or narrow almost hair-like scales; scales of female palpi usually appressed; abdomen without scales on the dorsal surface 13.
2. Abdominal scales obviously present on all the segments 3.
- Abdominal scales absent, or if present, confined to the terminal segments ("*Nyssorhynchus*") 8.
3. Abdominal scales forming distinct projecting lateral tufts (*Nyssorhynchus*, [= *Cellia*]) 4.
- Abdominal scales not forming tufts (*Neocellia*) 9.
4. Last joint of hind tarsi light, or at least light-tipped 5.
- Last joint of all tarsi entirely dark 7.
5. Last joint of fore and mid tarsi all dark; rather large yellowish species (5-6 mm.)* 1. *pharoensis*.
- Last joint of fore and mid tarsi light or light-tipped; smaller, less yellow species (4.5 mm. or less) 6.
6. Last joint of all tarsi wholly yellow; remaining joints regularly ringed with black and yellow; very small species (3 mm.) 2. *cinctus*.
- Last joint of all tarsi white tipped; remaining joints not ringed; larger species 3. *jacobi*.
7. Hind tarsi entirely dark 4. *argenteolobatus*.
- First four joints of hind tarsi with apical white rings 5. *squamosus*.
8. Last tarsal joint white; small species (3.5 mm.); Egyptian 6. *maculicosta*.
- Last tarsal joint not white; large species (7 mm.); East African 7. *christyi*.

* Unless otherwise stated, measurements denote the length of the body exclusive of the proboscis.

9. Hind tarsi entirely dark ; three white palpal bands in ♀, the first two narrow 8. *brunnipes*.
 Last two or three joints of hind tarsi white 10.
10. Four narrow white palpal bands ; wing-scales lanceolate ; legs spotted 9. *aureosquamiger*.
 Three palpal bands, the last two rather broad ; wing-scales much narrower 11.
11. Femora and tibiae white-spotted 12.
 Femora and tibiae not white-spotted 10. *ruffipes*.
12. Palpi white-spotted 11. *maculipalpis*.
 Palpi not white-spotted 12. *pretoriensis*.
13. Abdomen with lateral tufts of very long slender scales on each segment (*Christya*) 13. *implexus*.
 Abdomen without lateral scale-tufts 14.
14. Wing-scales mostly yellow, the black patches on the veins much reduced, but three long and one short black marks on the costa and first vein, the first two almost or quite united 15.
 Wings not so marked 16.
15. Last $2\frac{3}{4}$ joints of hind tarsi white 14. *theileri*.
 Last joints of hind tarsi dark 15. *wellcomei*.
16. Wings with at least three pale spots on the costal border (doubtful species are included in the next division) (*Myzomyia*) 17.
 Wings with at most two pale spots on the costal border 36.
17. Last hind tarsal joints white ; legs spotted 16. *natalensis*.
 Last hind tarsal joints not white 18.
18. Femora and tibiae more or less spotted with whitish ; tarsi distinctly ringed at the joints 19.
 Femora and tibiae not at all white-spotted 20.
19. Hind metatarsi with about five well-marked narrow whitish rings ; female palpi with four narrow white rings 17. *ardensis*.
 Hind metatarsi without distinct rings : female palpi with three white rings, the apical one broad 18. *costalis*.
20. Third vein with three dark and two light areas ; male palpi with the club mainly yellow, as in *costalis* 19. *pallidopalpi*.
 Third vein with only two dark areas (near base and apex), or entirely dark 21.
21. Palpi of female white only at the apex ; base of first fork-celli nearer apex of wing than that of second ; small, very dark species 20. *nili*.
 Palpi of female with three or four white rings 22.
22. Third vein mainly (*funestus*, type form, and *culicifacies*) or entirely dark ; mesonotum clothed with hairs 23.
 Third vein mainly pale 26.
23. Hind tarsi with fairly distinct pale rings ; wing-field with some pale spots 21. *longipalpis*.
 Legs entirely dark 24.

24. Wing-field entirely dark ; no pale scales even at bases of fork-cells 22. *rhodesiensis*.
 Pale spots present at bases of fork-cells, even in the darkest specimens 25.
25. Lighter species, Mediterranean and Oriental 23. *culicifacies*.
 Darker species (very variable), Ethiopian 24. *funestus*.
26. Palpi of female black-tipped 27.
 Palpi of female white-tipped (in *A. cinereus* the white scales at the tip are easily rubbed off) ; mesonotum with narrow but fairly distinct scales 30.
27. No dark scales on first fork-cell or on anterior branch of second 25. *impunctus*.
 Dark spots present (though sometimes small) on first fork-cell ... 28.
28. Vestiture of mesonotum consists of hairs 26. *hispaniola*.
 Vestiture of mesonotum consists of narrow scales 29.
29. Third and fourth costal spots smaller ; first fork-cell mainly pale-scaled 27. *chaudoyei*.
 Third and fourth costal spots larger ; first fork-cell mainly dark-scaled 28. *multicolor*.
30. Last joint of female palpi mainly dark, pale at each end ; large species, wing-length about 5 mm. 29. *cinereus*.
 Last joint of female palpi mainly or entirely white 31.
31. Tarsi dark ; middle ring on female palpi rather narrow 32.
 Tarsi with pale articulations 33.
32. Average wing-length 3.8 mm. 30. *transvaalensis*.
 Average wing-length 3 mm. 24. *funestus*.
33. Larger (about 5 mm.) ; Mediterranean 31. *superpictus*.
 Smaller ; Ethiopian ; middle and terminal pale rings on female palpi about equal and rather broad ; tarsal joints with narrow yellowish rings 34.
34. Larger, darker species (3.5-4.5 mm.) ; third and fourth costal spots larger 32. *marshalli*.
 Smaller, lighter species (3-3.2 mm.) ; third and fourth costal spots smaller 35.
35. A dark spot at apex of wing 33. *pitchfordi*.
 No dark spot at apex of wing 34. *flavicosta*.
36. Thorax clothed with narrow scales ; light spots on wings more numerous 37.
 Thorax clothed with hairs (excluding the scales near the front margin) ; wings very dark, or else quite unicolorous 39.
37. The two last palpal bands (in female) about equal and rather broad—as in *A. marshalli* ; tarsal joints with rather broad white apical rings 35. *austeni*.
 Palpi of female with four narrow whitish rings ; the terminal joint having a dark ring in the middle 38.
38. Numerous yellow forked scales on the head ; legs dark, tarsi scarcely ringed 36. *distinctus*.
 No yellow forked scales on head ; femora and tibiae spotted with whitish, tarsi distinctly ringed at the joints 18. *costalis* var. *melas*.

39. Last 2-3 joints of hind tarsi white; female with a tuft of scales on the ventral side of the last abdominal segment (*Myzorhynchus*)
37. mauritanus.
 Last joints of hind tarsi not white; female without ventral scale-tuft 40.
 40. Blackish species; wings with some pale spots 41.
 Lighter species; wings without any pale spots 42.
 41. Female palpi shaggily scaled; pale scales of wings occurring mainly on the fourth, fifth and sixth veins *38. umbrosus.*
 Female palpi with appressed scales; pale scales of wings less numerous and occurring mainly on the first vein *39. smithii.*
 42. Wings with dark spots formed by accumulation of scales *40. maculipennis.*
 Wings without any dark spots 43.
 43. First fork-cell longer than second *41. algeriensis.*
 Fork-cells of equal length *42. antennatus.*

Unidentified species: *A. minuta*, Macq., Dipt., I, p. 33 (1834). The complete description is as follows: "3. A. NAIN.—*Anopheles minuta*, nob. Long. 2 lig. Gris. Palpes à anneaux blancs. Ailes à bord brun, et à trois petites taches blanchâtres. ♀. Du Sénégal. Muséum d'histoire naturelle à Paris." If the type is still in existence the species might be identifiable, but not otherwise.

1. **A. pharoensis**, Theo., Mon. Cul. I, p. 169 (1901).
Cellia pharoensis, Theo., Mon. Cul. III, p. 109 (1903).
Nyssorhynchus bozasi, N.-L., Arch. Parasit. X, p. 246 (1906).
 Neveu-Lemaire gives good figures of this species.
 Palestine; Egypt; Sudan; Gambia; N. and S. Nigeria; Togo; Belgian Congo; Angola; S. Rhodesia; Madagascar.
2. **A. cinctus**, Newst. and Cart. (*Cellia*), Ann. Trop. Med. IV, p. 381 (1910).
 Ashanti.
3. **A. jacobi**, Hill and Haydon (*Cellia*), Ann. Natal Mus. I, p. 144 (1907).
 Natal.
4. **A. argenteolobatus**, Gough (*Cellia*), Transvaal Dept. Agric., Rept. Gov. Vet. Bact. 1908-09, p. 116 (1910).
Cellia pseudosquamosa, Newst. and Cart., Ann. Trop. Med. V, p. 236 (1911).
 Transvaal; N.E. Rhodesia.
5. **A. squamosus**, Theo., Mon. Cul. I, p. 167 (1901).
Cellia squamosa, Theo., Mon. Cul. III, p. 109 (1903).
Cellia tamanarivensis, Vent., Bull. Mus. Paris, XII, p. 198 (1906).
 ? *Cellia pretoriensis*, Gough (*nec* Theo.), Transvaal Dept. Agric., Rept. Gov. Vet. Bact. 1908-09, p. 117 (1910).
 Egypt; Sudan; N. Nigeria; Sierra Leone; Gold Coast; Angola; Natal; Transvaal; S. Rhodesia; Nyasaland; British E. Africa; Madagascar.
 I am unable to separate *C. pretoriensis* and *C. tamanarivensis* from *A. squamosus* by comparing the descriptions, and consider them the same.
Cellia squamosa, var. *arnoldi*, Newst. and Cart., Ann. Trop. Med. V, p. 238 (1911), (*Cellia arnoldi*, Sph. and Chr., Prac. Stud. of Malaria, Ed. III, 1908,

p. 175). The fact that this differs from typical *A. squamosus* only in the absence of the white pleural lines, would certainly seem to justify sinking it under that species, yet it is hardly conceivable that larvae so different as those described by Hill and Haydon and Newstead and Carter could be conspecific. Possibly some confusion of adults has arisen. The character given for the separation of the adults seems quite inadequate.

6. *A. maculicosta*, Becker, Mitt. Zool. Mus. Berlin, II, p. 69 (1903).

Dr. Becker has kindly supplied me with the following additional notes on the type:—"Thorax grey, not brown. Pleurae and sternum light grey, with red-brown patches, not dark as in *pharoensis*. Abdomen: scales yellowish, no darker scales on side and at the end of the abdomen and no broad scales sticking outwards on the borders. Femora and tibiae are quite yellow brown with some little brown irregular patches, but not banded, the hind tarsi quite yellow-brown, their base somewhat darker, the ends of them and the last joint yellow, not white. Wings in general pictured like *A. pharoensis*. Length 3.5 mm., not 8 mm.

"After this I believe *A. maculicosta* is a species closely allied to *A. pharoensis*, but differs in the ornamentation of the pleurae and the legs and the length of the body." In spite of the differences indicated, I am inclined to think that *A. maculicosta* was described from a small rather worn specimen of *A. pharoensis*. The lateral projecting scales of the abdomen may well have been rubbed off, and as to size, I can only say that I have seen no specimen of *A. pharoensis* which exceeded 6 mm. in length, and that they are often a good deal less. *A. maculicosta* was described from Egypt, where *A. pharoensis* is common.

7. *A. christyi*, Newst. and Cart. (*Neocellia*), Ann. Trop. Med. V, p. 238 (1911).

A large mosquito resembling *A. mauritanus* in general appearance, but with more distinctly spotted wings and without white hind tarsi; it is easily distinguished with a lens by its scaly abdomen, the scales not forming lateral tufts. The dark spots of the wings stain the membrane, so that even a denuded specimen would be easy to recognise.

Uganda; British E. Africa (Njoro and Nairobi, *T. J. Anderson*).

8. *A. brunripes*, Theo. (*Nyssorhynchus*), Mon. Cul. V, p. 64 (1910).

Angola.

9. *A. aureosquamiger*, Theo. (*Pyrethophorus*), Mon. Cul. IV, p. 73 (March 18, 1907).

Hill and Haydon in their description of *A. natalensis* make no mention of the scales on the thorax. This may be only an omission, as there seem no other characters to separate *natalensis* and *aureosquamiger*.

Transvaal.

10. *A. rufipes*, Gough, Transvaal Dept. Agric., Rept. Gov. Vet. Bact. 1908-09, p. 119 (1910) (as var. of *Nyssorhynchus pretoriensis*).

Anopheles (*Nyssorhynchus*) *watsoni*, Edw., Bull. Ent. Res. II, p. 143 (1911), (nec *Pyrethophorus watsonii*, Leicester, 1908).

This species seems rather variable in the amount of white on the hind legs. Specimens bred by Dr. Ingram at Bole, Gold Coast, have the white ring at the

apex of the hind metatarsus almost absent, and no dark ring at the base of the third hind tarsal joint. These specimens differ from the Oriental *A. fuliginosus* in having no scales on the abdomen of the female.

Transvaal; British E. Africa (Masongaleni, *S. A. Neave*); Gold Coast (Bole, *Dr. Ingram*); N. Nigeria; S. Nigeria (*Oshogbo, Dr. J. J. Simpson*).

11. *A. maculipalpis*, Giles, Gnats, Ed. 2, p. 297 (1902).

Nyssorhynchus indiensis, Theo., Mon. Cul. V, p. 62 (1910).

Transvaal; S. Rhodesia; Angola; Belgian Congo; N. Nigeria; Mauritius; India.

12. *A. pretoriensis*, Theo. (*Nyssorhynchus*), Mon. Cul. III, p. 99 (1903).

Transvaal; Natal.

13. *A. implexus*, Theo. (*Christya*), Royal Soc., Rept. Sleeping Sickness Com., III, p. 34 (1903).

A very striking species, one of the largest of the genus. The third and fourth joints of the hind tarsi are white, the fifth black. Femora and tibiae spotted.

Uganda; British C. Africa (?). The latter record is now omitted by Theobald.

14. *A. theileri*, nom. nov.

Pyretophorus albipes, Theo., U. South Afr. Dept. Agric., First Rept. Vet. Res. p. 243 (1911) (nec *A. albipes*, Theo., 1901).

A very distinct species, but in its wing-markings almost identical with the following.

Transvaal.

15. *A. wellcomei*, Theo., First Rept. Welle. Lab. p. 64 (1904).

Sudan; N. Nigeria; Angola.

16. *A. natalensis*, Hill and Haydon (*Myzorhynchus*), Ann. Natal Mus. I, p. 152 (March 8, 1907).

Natal.

A. (Pyretophorus) watsonii, Leicester, from Malaya, answers rather closely to the description of this species, the only apparent distinctions being that in *A. watsonii* the wing-scales are shorter and less dense, and the three additional spots on the first longitudinal vein reach the costa.

17. *A. ardensis*, Theo. (*Pyretophorus*), J. Econ. Biol. I, p. 17 (1905).

This species, though superficially very like *A. costalis*, probably has its nearest ally in *A. natalensis*.

Natal.

18. *A. costalis*, Theo., Mon. Cul. I, p. 157 (1901).

? *A. costalis*, Lw., Berlin ent. Zeitschr. X, p. 55 (1866).

A. merus, Dönitz, Zeits. Hygiene, XLI, p. 77 (1902).

A. gracilis, Dönitz, l.c. p. 76.

A. arabiensis, Patton, J. Bombay Nat. Hist. Soc. p. 625 (1905).

Loew's original description includes no mention of the spots on the legs or of bands on the tarsi, hence it is most probable that Dönitz is correct in regarding Theobald's identification of *A. costalis* as erroneous. But without examination

of the type it would probably be impossible to determine which is the true *costalis*, and so in the absence of proof of its error, I have allowed the name *costalis* to stand for this species. I agree, however, with Dönitz that *A. costalis*, Lw., is very likely to prove the same as *A. cinereus*, Theo., or perhaps *A. transcaalensis*, Carter.

This species is in many respects a variable one, and is common throughout the Ethiopian region.

19. ***A. pallidopalpi***, Theo. (*Feltinella*), Mon. Cul. IV, p. 57 (1907).

Sierra Leone.

The statement that in this species the "basal lobe of the genitalia" is "divided into two segments" is incorrect; the type specimen is merely broken.

20. ***A. nili***, Theo. (*Myzomyia*), First Rept. Welle. Lab. p. 65 (1904).

Myzomyia funesta, var. *umbrosa*, Theo., Mon. Cul. III, p. 34 (1903), (*nec Myzorhynchus umbrosus*, Theo.).

Myzomyia unicolor, Grünb., Zool. Anz. XXIX, p. 379 (1905).

Anopheles (Myzomyia) umbrosa, Edw., Bull. Ent. Res. II, p. 142 (1911).

Sudan; N. & S. Nigeria; Togo.

Both *M. funesta* var. *umbrosa* and *M. umbrosus* were described by Theobald in his third volume, but the latter is better known and so the name *A. umbrosus* is retained for it. The idea of page precedence is rejected as absurd.

21. ***A. longipalpis***, Theo. (*Myzomyia*), Mon. Cul. III, p. 37 (1903).

Brit. E. Africa (Makindu, 3,300 feet, 6. iv. 1911, *S. A. Neave*, 1♀); Nyasaland (Blantyre, 1910, *Dr. J. E. S. Old*).

22. ***A. rhodesiensis***, Theo. Mon. Cul. I, p. 184 (1901).

S. Rhodesia; Transvaal; Sierra Leone (?).

This species has been confused with the dark varieties of *A. funestus*, and not all the records of it can be trusted.

23. ***A. culicifacies***, Giles, Ent. Mo. Mag. XXXVII, p. 197 (1901).

Pyretophorus sergentii, Theo., Mon. Cul. IV, p. 68 (1907).

This synonymy is given after a comparison of the type, and of a large series of specimens from India.

Algeria; India.

24. ***A. funestus***, Giles, Liverp. S. Trop. Med. Mem. 2, p. 50 (1900).

A. hebes, Dönitz, Zeit. f. Hygiene, XLI, p. 84 (1902).

Widely distributed in the Ethiopian region, but much commoner in West Africa. Some of the varieties may be characterised as follows:—

(i) *A. funestus* (type form). A pale spot on the costa near the base; third vein pale-scaled in the middle, sometimes for as much as one-third of its length; fringe spots distinct.

Dönitz's *A. hebes*, from E. Africa, resembles this form, but the wings seem to be rather narrower and often quite half of the third vein is pale-scaled. Theobald refers to the palpi of *A. hebes* as "mainly white"; this is merely an error of translation from Dönitz's description.

(ii) var. *subumbrosa*, Theo., Mon. Cul. III, p. 34 (1903). No pale spot on costa near base; third vein with some pale scales in middle; fringe spots usually distinct. As far as I can see Theobald's *Myzomyia leptomerus* (Mon. Cul. III, p. 38) is identical with this variety.

(iii) var. *bisignata*, Grünb., Zool. Anz. XXIX, p. 378 (1905). No pale spot near base of costa; third vein, and sometimes also the fifth vein, entirely dark; fringe spots indistinct or absent. The darkest specimens of this variety approach *A. rhodesiensis*, but always have pale spots at the bases of the fork cells, and the female palpi are shorter than in the latter species.

25. **A. impunctus**, Dönitz, Zeit. f. Hygiene, XLI, p. 67 (1902).

Egypt.

26. **A. hispaniola**, Theo. (*Myzomyia*), Mon. Cul. III, p. 49 (1903).

Pyretophorus myzomyfacies, Theo., Mon. Cul. IV, p. 69 (1907).

Algeria; Spain.

27. **A. chaudoyei**, Theo. (*Pyretophorus*), Mon. Cul. III, p. 68 (1903).

Pyretophorus nigrifasciatus, Theo., Mon. Cul. IV, p. 65 (1907).

Algeria; Cyprus; India.

8. **A. multicolor**, Camboulin, C. R. Acad. Sci., CXXXV, p. 704 (1902).

I believe this species is correctly identified, but there is one strange statement in the original description, namely, that the wings have blue markings. I assume this merely refers to iridescence, which, however, is not visible in the specimens at my disposal. Patton's *A. azriki* from Aden must be very close to this, but has the wing-fringe entirely dark.

Suez; Cairo (*F. Willcocks*).

29. **A. cinereus**, Theo., Mon. Cul. I, p. 161 (1901).

A. (Myzomyia) jehaffi, Patton, J. Bombay Nat. Hist. Soc. p. 630 (1905).

Aden; British E. Africa; S. Rhodesia; Transvaal; Natal; Cape.

30. **A. transvaalensis**, Carter (*Pyretophorus*), Entomologist, XLIII, p. 237 (1910).

This is, in part, the species referred to by Hill & Haydon as *Myzomyia funesta*, but from their descriptions it would seem that they also included *A. marshalli*, and perhaps *A. pitchfordi*, under the same specific name. How far these forms really represent distinct species must remain doubtful for the present.

British E. Africa; Transvaal; Natal.

31. **A. superpictus**, Grassi, Reale Accad. Linc. p. 78 (1900).

Theobald's record of this from Mashonaland probably refers to some other species (perhaps to *A. transvaalensis*); he does not repeat it in his last volume. *A. superpictus* seems to be distinguished from *A. nursei* (which also occurs in the Mediterranean region) only by the banded tarsi.

32. **A. marshalli**, Theo. (*Pyretophorus*), Mon. Cul. III, p. 77 (1903).

Pyretophorus pseudocostalis, Theo., Mon. Cul. V, p. 41 (1910).

Uganda; British E. Africa; Nyasaland; S. Rhodesia; Transvaal; Angola.

33. **A. pitchfordi**, Giles, Rev. Anoph. p. 34 (1904).
Zululand : Angola : Congo ; Uganda.
34. **A. flavicosta**, Edw., Bull. Ent. Res. II, p. 142 (1911).
N. Nigeria.
35. **A. austeni**, Theo. (*Pyretophorus*), Entomologist, XXXVIII, p. 102 (1905).
Angola.
36. **A. distinctus**, Newst. & Cart. (*Pyretophorus*), Ann. Trop. Med. V, p. 234 (1911).
N. E. Rhodesia.
37. **A. mauritianus**, Grandpré, Planter's Gaz. Press (1900).
A. paludis, Theo., Royal Soc., Rept. Malaria Com. p. 75 (July 6, 1900).
The tarsal character given by Theobald for separating *mauritianus* and *paludis* breaks down, and I feel sure there is really only one species. There is, however, a fairly constant difference between specimens from East and West Africa : in the former there is a *broad* white patch embracing the apex of the hind tibia and the base of the metatarsus, on the upper surface : in the latter, which may be known as var. *paludis*, the patch is very narrow and inconspicuous.
Widely distributed in Africa, but as a rule uncommon. In Nairobi, British East Africa, however, it appears to be the commonest *Anopheles*.
I have been unable to consult Grandpré's original description, and do not know whether his name has priority. It has been retained because the form with a black spot at the base of the 3rd hind tarsal joint is by far the commoner, both in East and West Africa.
38. **A. umbrosus**, Theo. (*Myzorhynchus*), Mon. Cul. III, p. 87 (1903).
Myzorhynchus obscurus, Grünb., Zool. Anz. XXIX, p. 380 (1905).
Myzorhynchus strachani, Theo., Mon. Cul. IV, p. 85 (1907).
S. Nigeria : Congo (Coquilhatville, 20. XI. 1910, 1 ♀, *Dr. A. Yale Massey*) : Kamerun ; Malay States.
39. **A. smithii**, Theo., Entomologist, XXXVIII, p. 101 (1905).
Sierra Leone.
40. **A. maculipennis**, Mg., Syst. Besch. I, p. 11 (1818).
Algeria : Tunis ; Europe ; N. America (?).
41. **A. algeriensis**, Theo., Ann. Inst. Pasteur, XVII, p. 2 (1903) ; id., Mon. Cul. III, p. 21.
Algeria.
It is possible that this species may prove to be identical with *A. bifurcatus*, L.
42. **A. antennatus**, Becker, Mitt. Zool. Mus. Berlin, II, p. 68 (1903).
Egypt.
I have been unable to examine this species.